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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,161	10/11/2001	J. Kevyn Smith	194-27668-US	9119

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EXAMINER

BARTH, VINCENT P

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 02/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/975,161

Applicant(s)

SMITH ET AL.

Examiner

Vincent P. Barth

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullins, et al., U.S. Patent No. 6,501,072 (31 Dec., 2002), in view of Chandy, et al., "A Novel Technique for On-line Measurement of Scaling using Multimode Optical-fiber Sensor for Industrial Applications", Sensors and Actuators B 71 (2000), pp. 19-23.

3. Referring to Claim 1, Mullins discloses a system for determining the precipitation onset of asphaltenes in a formation fluid (i.e. petroleum) by means of varying pressure, and measuring the size of the particles (col. 2, lns. 23-29). Mullins also determines the size of the particles by using known measured refraction properties of the substance, and thus from the optical density, determining the size of the particles (col. 5, lns. 61-63 and col. 6, lns. 1-36). Moreover, Mullins subjects the samples to light in both the visible range from approximately 400 nm to the IR range up to and beyond 1500 nm (col. 5, lns. 30-34). Mullins introduces optical fibers 34 as one means to provide measurement (col. 4, ln. 31 and Fig. 2). However, Mullins does not determine the onset and rate as a function of changes in the refractive indices. Chandy discloses that an optical fiber sensor can measure the scaling in aqueous solution in real-time, by measurement of the

Art Unit: 2877

refractive index changes at the end of said fiber (p. 1, para. 1 and 2). Mullins and Chandy are analogous art, since they are from a similar problem solving area, in that each involves measurements of precipitates and the scaling resulting therefrom. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for combining the references would have been to gain the benefit of real-time in-situ analysis features from Chandy, and incorporate said features into analyzing oil precipitates as in Mullins. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefits.

4. Referring to Claim 10, cleaning, calibrating, inserting and extracting probes in the context of in-situ measurements has been well known in the art (see MPEP §2144.03), and as may be acknowledged by the commercially availability of equipment for such purposes as cited by Applicants.

5. Referring to Claim 21, Mullins discloses a system for determining the precipitation onset of asphaltenes in a formation fluid (i.e. petroleum) by means of varying pressure, and measuring the size of the particles (col. 2, lns. 23-29). Mullins also determines the size of the particles by using known measured refraction properties of the substance, and thus from the optical density, determining the size of the particles (col. 5, lns. 61-63 and col. 6, lns. 1-36). Mullins introduces optical fibers 34 as one means to provide measurement (col. 4, ln. 31 and Fig. 2), and does so in the form of a probe (see Fig. 1). However, Mullins does not determine the onset and rate as a function of changes in the refractive indices. Chandy discloses that an optical fiber sensor can measure the scaling in aqueous solution in real-time, by measurement of the refractive index

Art Unit: 2877

changes at the end of said fiber (p. 1, para. 1 and 2). Mullins also discloses an “electronics and processing” unit 18 (see Fig. 1).

6. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullins, et al., U.S. Patent No. 6,501,072 (31 Dec., 2002), in view of Chandy, et al., “A Novel Technique for On-line Measurement of Scaling using Multimode Optical-fiber Sensor for Industrial Applications”, Sensors and Actuators B 71 (2000), pp. 19-23, further in view of Papanyan, U.S. Pat. No. 6,388,251 (14 May, 2002).

7. Referring to Claims 2 and 3, Mullins and Chandy contain all of the claimed features, although not explicitly disclosing an Attenuated Total Reflectance probe (ATR). However, Papanyan discloses an optical probe for use in analysis of formation fluids, and in which optical fibers 120 lead from the probe into the optical assembly (col. 6, lns. 3-4), and which suggests the use of an ATR probe for analysis of borehole fluids (col. 3, ln. 65 to col. 4, ln. 1). Mullins and Chandy are analogous art, since they are from a similar problem solving area, in that each involves measurements of precipitates and the scaling resulting therefrom. The motivation for combining the references would have been to gain the benefits of the ATR probe for analysis of the formation fluids. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefits.

8. Referring to Claims 4-9, Mullins explicitly subjects the samples to light in both the visible range from approximately 400 nm to the IR range up to and beyond 1500 nm (col. 5, lns. 30-34). Therefore, the ranges 400-1500 nm in Claim 4 are within the disclosed range of Mullins. See MPEP §2131.03 and §2144.05. Moreover, the other ranges in Claims 5-9 represent non-

Art Unit: 2877

critical limitations. The Specifications in the instant Application do not disclose why these ranges are critical limitations over the prior art. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Moreover, it appears that present invention proposed would perform equally well with the ranges as disclosed in the prior art. Accordingly, these ranges would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. In the alternative, “[I]t is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP §2144.05(II).

9. Claim 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullins, et al., U.S. Patent No. 6,501,072 (31 Dec., 2002), in view of Chandy, et al., “A Novel Technique for On-line Measurement of Scaling using Multimode Optical-fiber Sensor for Industrial Applications”, *Sensors and Actuators B* 71 (2000), pp. 19-23, further in view of Krajicek, U.S. Pat. No. 4,282,929 (11 Aug. 1981) and Papanyan, U.S. Pat. No. 6,388,251 (14 May, 2002).

10. Referring to Claim 11, Mullins discloses a system for determining the precipitation onset of asphaltenes in a formation fluid (i.e. petroleum) by means of varying pressure, and measuring the size of the particles (col. 2, lns. 23-29). Mullins also determines the size of the particles by using known measured refraction properties of the substance, and thus from the optical density, determining the size of the particles (col. 5, lns. 61-63 and col. 6, lns. 1-36). Moreover, Mullins subjects the samples to light in both the visible range from approximately 400 nm to the IR range up to and beyond 1500 nm (col. 5, lns. 30-34). Mullins introduces optical fibers 34 as one means

Art Unit: 2877

to provide measurement (col. 4, ln. 31 and Fig. 2). However, Mullins does not determine the onset and rate as a function of changes in the refractive indices. Chandy discloses that an optical fiber sensor can measure the scaling in aqueous solution in real-time, by measurement of the refractive index changes at the end of said fiber (p. 1, para. 1 and 2). Mullins and Chandy are analogous art, since they are from a similar problem solving area, in that each involves measurements of precipitates and the scaling resulting therefrom. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for combining the references would have been to gain the benefit of real-time in-situ analysis features from Chandy, and incorporate said features into analyzing oil precipitates as in Mullins. Krajicek discloses that scaling may be reduced by the introduction of acidic compounds, such as sulfurous oxides and/or nitrous oxides (col. 2, lns. 56-57). Mullins, Chandy and Krajicek are analogous art, since they are from a similar problem solving area, in that each involves problems relating to scaling. The motivation for combining the references would have been to manipulate the known methods of reducing scaling, and test the results. Finally, the probe in Mullins is likely to implicitly withstand the temperature and pressure of oil drilling, since the system operates in that context. However, Papanyan also includes a sapphire tip 132 at the end of the probe for durability (col. 6, ln. 11). Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefits.

11. Referring to Claims 12 and 13 Mullins and Chandy contain all of the claimed features, although not explicitly disclosing an Attenuated Total Reflectance probe (ATR). However, Papanyan discloses an optical probe for use in analysis of formation fluids, and in which optical

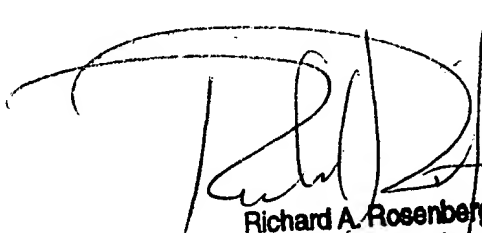
Art Unit: 2877

fibers 120 lead from the probe into the optical assembly (col. 6, lns. 3-4), and which suggests the use of an ATR probe for analysis of borehole fluids (col. 3, ln. 65 to col. 4, ln. 1). Mullins and Chandy are analogous art, since they are from a similar problem solving area, in that each involves measurements of precipitates and the scaling resulting therefrom. The motivation for combining the references would have been to gain the benefits of the ATR probe for analysis of the formation fluids. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefits.

12. Referring to Claims 14-19, Mullins explicitly subjects the samples to light in both the visible range from approximately 400 nm to the IR range up to and beyond 1500 nm (col. 5, lns. 30-34). Therefore, the ranges 400-1500 nm in Claim 4 are within the disclosed range of Mullins. See MPEP §2131.03 and §2144.05. Moreover, the other ranges in Claims 5-9 represent non-critical limitations. The Specifications in the instant Application do not disclose why these ranges are critical limitations over the prior art. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Moreover, it appears that present invention proposed would perform equally well with the ranges as disclosed in the prior art. Accordingly, these ranges would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. In the alternative, “[I]t is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP §2144.05(II).

CONCLUSION

13. Applicants' Claims 1-21 are rejected based on the reasons set forth above.
14. Any inquiries concerning this communication from the examiner should be directed to Vincent P. Barth, whose telephone number is 703-605-0750, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday.
15. If attempts to reach the examiner prove unsuccessful, the examiner's supervisor is Frank G. Font, who may be reached at 703-308-4881.
16. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Richard A. Rosenberger
Primary Examiner